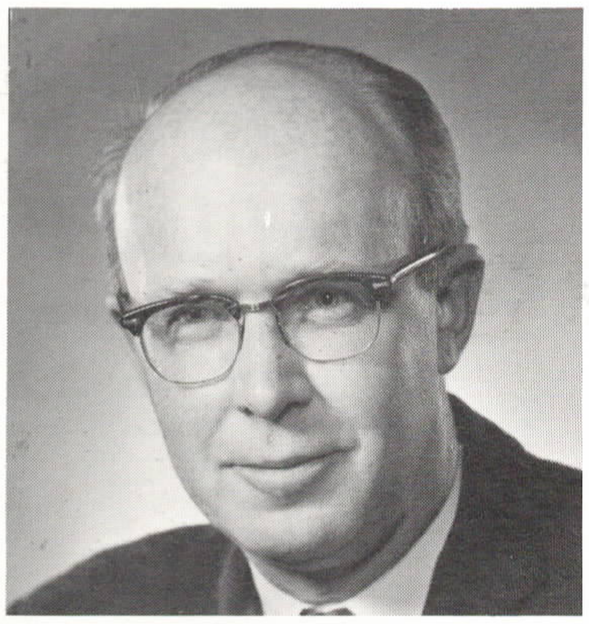
Number Three — 1977

THE LORAM STORY

Featuring Western Decalta Petroleum Limited

Message from Management



A. H. ROSS
President
Western Decalta
Petroleum Ltd.

Having introduced Western Decalta to readers of the Loram Story just a few months ago, we are pleased to be asked to return so soon to explain a little more about the company and the industry.

The temptation is to start at the end — to tell you of new ventures and new processes. We could explain that we don't just pump oil or gas, but that we are seekers of new energy sources using sophisticated techniques and that we are heavily involved in enhanced recovery of existing resources.

All this is true, but it may be better to start our story a few steps earlier. After all, sophisticated exploration doesn't mean much unless you know what petroleum is, and where and how it is found. And enhanced recovery loses something in the telling until you know the conventional methods of recovery.

So what we are attempting to do in our pages of this issue is to explain that searching for, and using, petroleum is one of man's ancient commercial enterprises. And we will attempt to lead you from the asphalt scum on the Dead Sea to the Turner Valley oil field.

Rather than using corporate organization charts, we would like to tell you a little more about the people of Western Decalta through profiles of two old friends on the staff.

In later issues we will take the opportunity to bring you closer to present places and activities, and to have you meet more of the people of Western Decalta.

THE LORAM STORY

Vol. 25 1977 No. 3

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Front Cover

Pump jack which coaxes raw materials for petroleum products to the surface has become almost a trademark of the industry.

Back Cover

Loram International's General Contracts Division provided the mechanical muscles to uncover Klimax coal for Manalta Coal Ltd.

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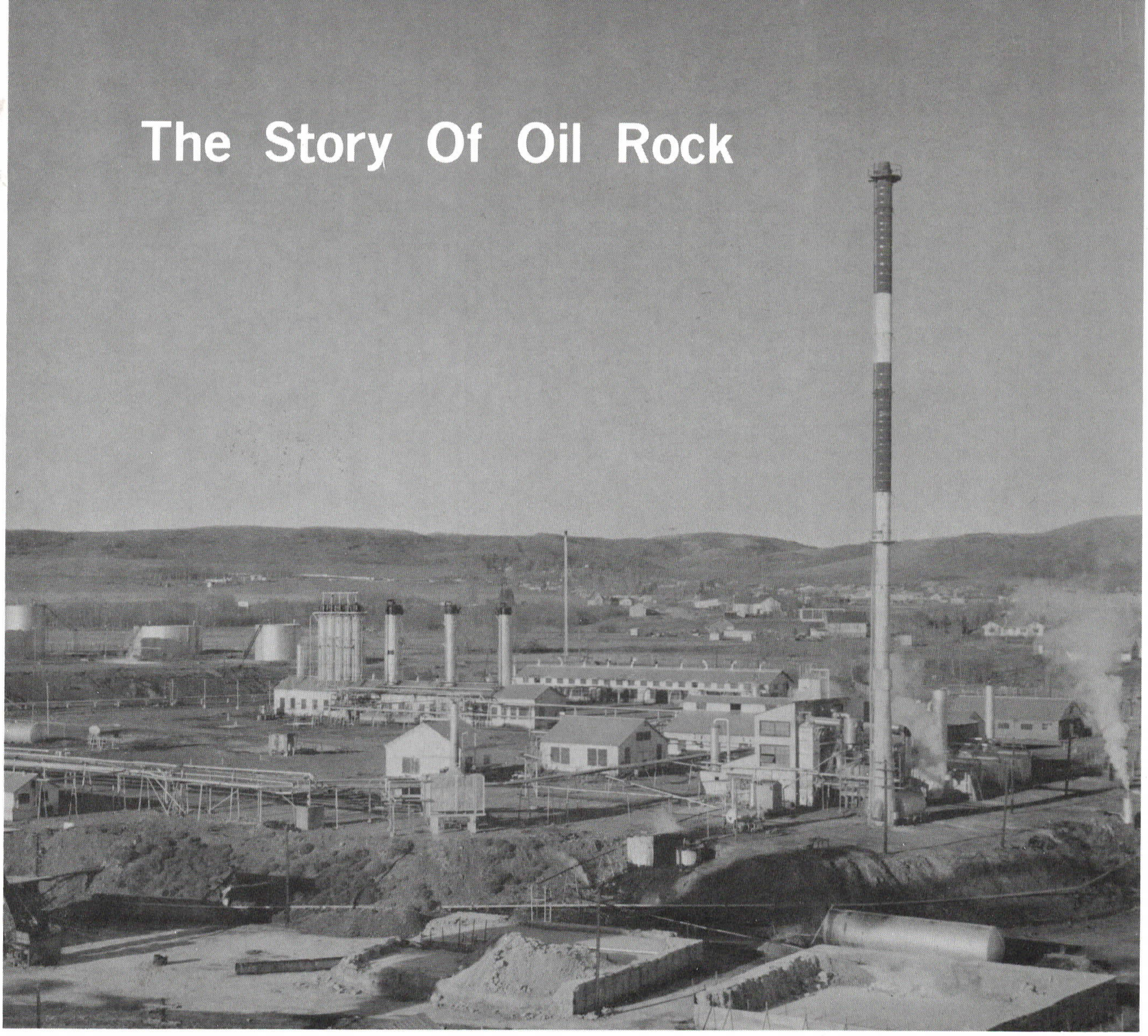
The Story Of Oil Rock



Familiar landmark at Turner Valley, Alberta, Western Decalta's plant produces butane, gasoline, natural gas and liquid sulphur.

When we pull our car up to a gas pump for a tank of high octane we are sometimes tempted to feel superior because we are living in the age of petroleum. Fact is, though, that thousands of years ago our ancient counter parts were pulling their chariots or triremes up to a pool of low octane for a pailful of asphalt.

Centuries before the birth of Christ the Dead Sea was known as Lake Asphaltites because of the semi-solid liquids washed up on shore from underwater seepages. These liquids were gathered to be used as caulking for ships, or for water-tight or air-tight vessels.

The word "petroleum" can be an inclusive term for a complex mixture of hydrocarbons that occur in the earth in liquid, gaseous or semi-solid form. A hydrocarbon is a complex compound of hydrogen and carbon. Generally, though, petroleum refers to crude oil recovered from some depth within the earth through boreholes.

"Petroleum" literally means "rock oil", being derived from the Greek "petra" and the Latin "oleum" meaning, respectively, "stone" and "oil".

From the early days of recorded history, most civilizations have made some use of petroleum. Generally it was used as pitch for caulking, but it was also used as a fiery weapon, and as a source of eternal flames to a specially-honored god.

Until the early years of the last century, whale oil was probably the major lubricant and illuminating fluid. But whales were becoming scarce and even though increasing use was being made of coal oil — kerosene — there was an apparent need for a cheaper and more abundant liquid.

The first commercial oil well in North America was completed in 1858 at Oil Springs, Ontario near Petrolia and Sarnia. The following year the first oil well drilled successfully in the United States was brought in from a depth of 69½ feet near Titusville, Pennsylvania. Since those historical beginnings, petroleum exploration and development spread quickly over the con-

Below, service rig pulls continuous rod from a well. Right, lab provides quality control.

tinent, spurred by the need for an energy source, rather than as a needed lubricant or illuminating liquid.

The petroleum hydrocarbons range from a light gas — methane — to a series of heavy solids. In familiar form they would be, from light to heavy: gases, gasolines, kerosene, gas oil, lubricating oil, residual fuel oil, greases, and, finally, asphalt.

These products are refined and separated by distillation under high pressures and temperatures.

Source of most petroleum is organic material probably derived from the single-cell plankton and other marine life that lived in salt, brackish or fresh water. These were abundant in the seas about 300 to 800 million years ago. Sediments deposited over millions of years, and in the right geological environment, formed petroleum reservoirs. For the creation of a petroleum trap, or reservoir, a porous rock, such as sandstone or limestone, must be contained by a non-porous rock such as shale.

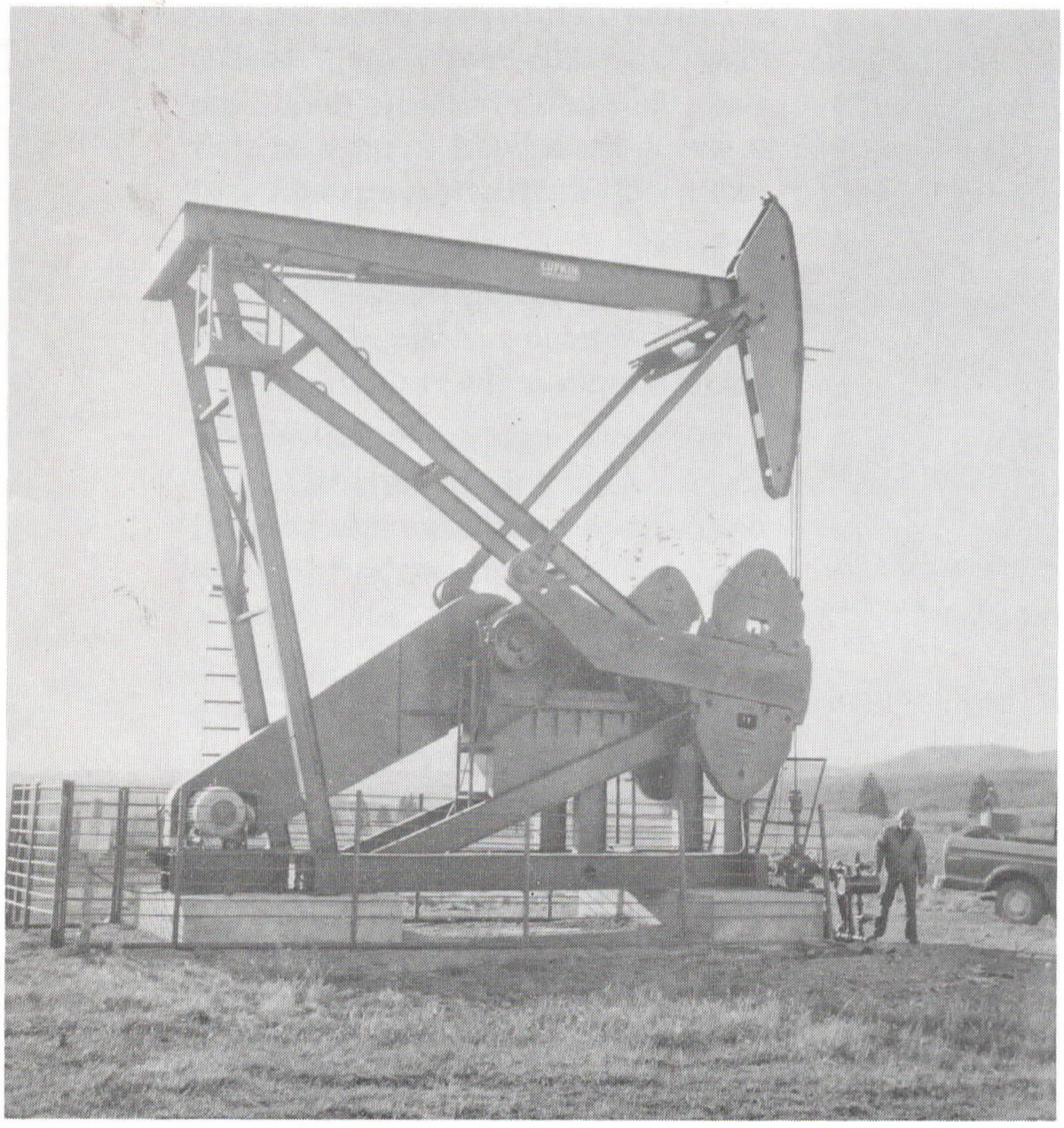
Early wells were drilled with impact-type tools; the method was called cable-tool drilling. These holes allowed oil and gas to flow to the surface in large quantities as soos as a producing formation was penetrated. The result: a spectacular, but wasteful "gusher".

During the last 40 years, cable-tool drilling has been supplanted by rotary drilling in which a drill bit rotates while bearing down on rock at the bottom of the well. Probably the greatest advantage of rotary drilling over cable tooling is that the hole being drilled is kept full of "mud" during drilling. This "mud" is a weighted fluid mixture of chemicals, oil, water and weighting materials, and it serves two important purposes: it prevents "blowouts" or "gushers", and it carries the crushed rock to the surface so that the drilling is continuous until the bit is dull.

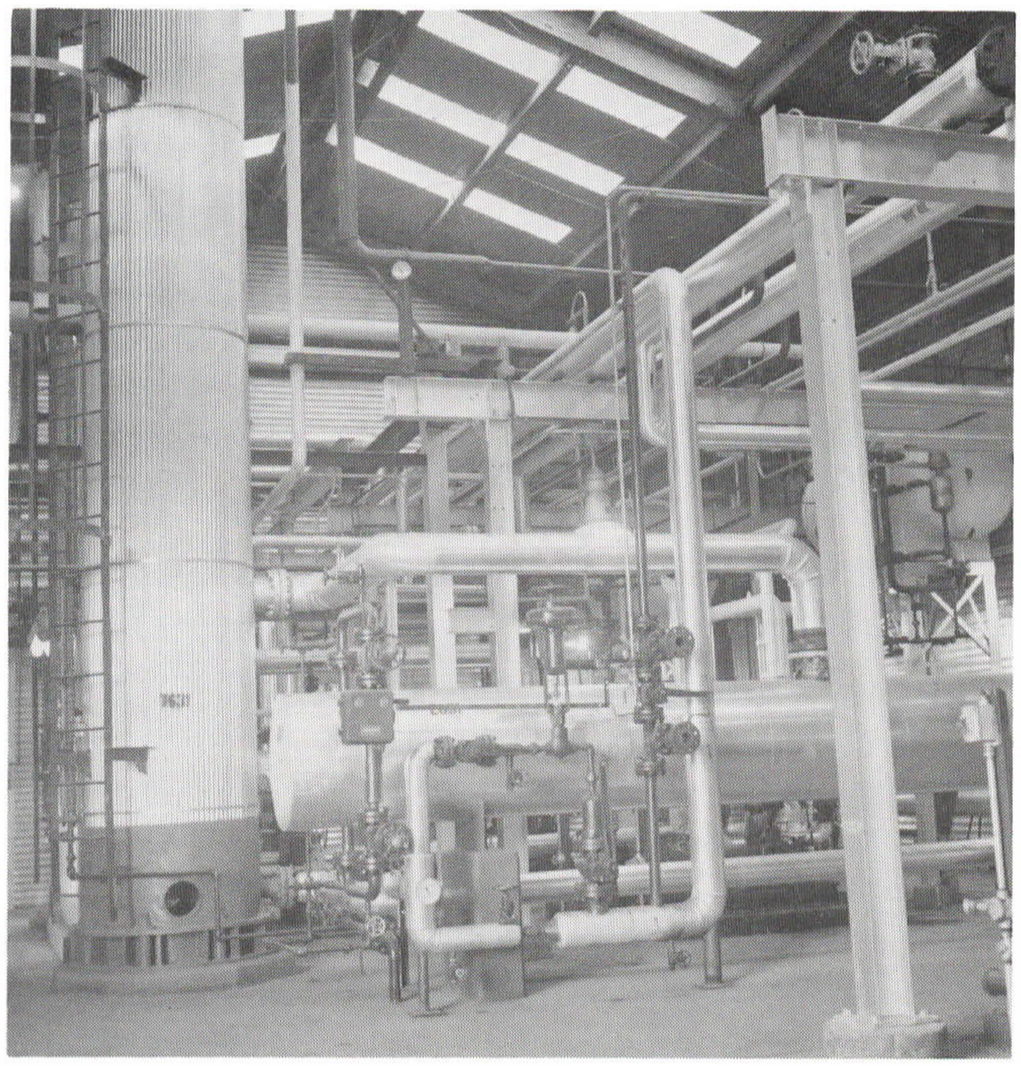
The drill bit is connected to the surface by hollow steel tubes called "drill pipe", and this introduces us to the characteristic tall derrick which contains the hoisting equipment used to raise and lower the drill pipe.

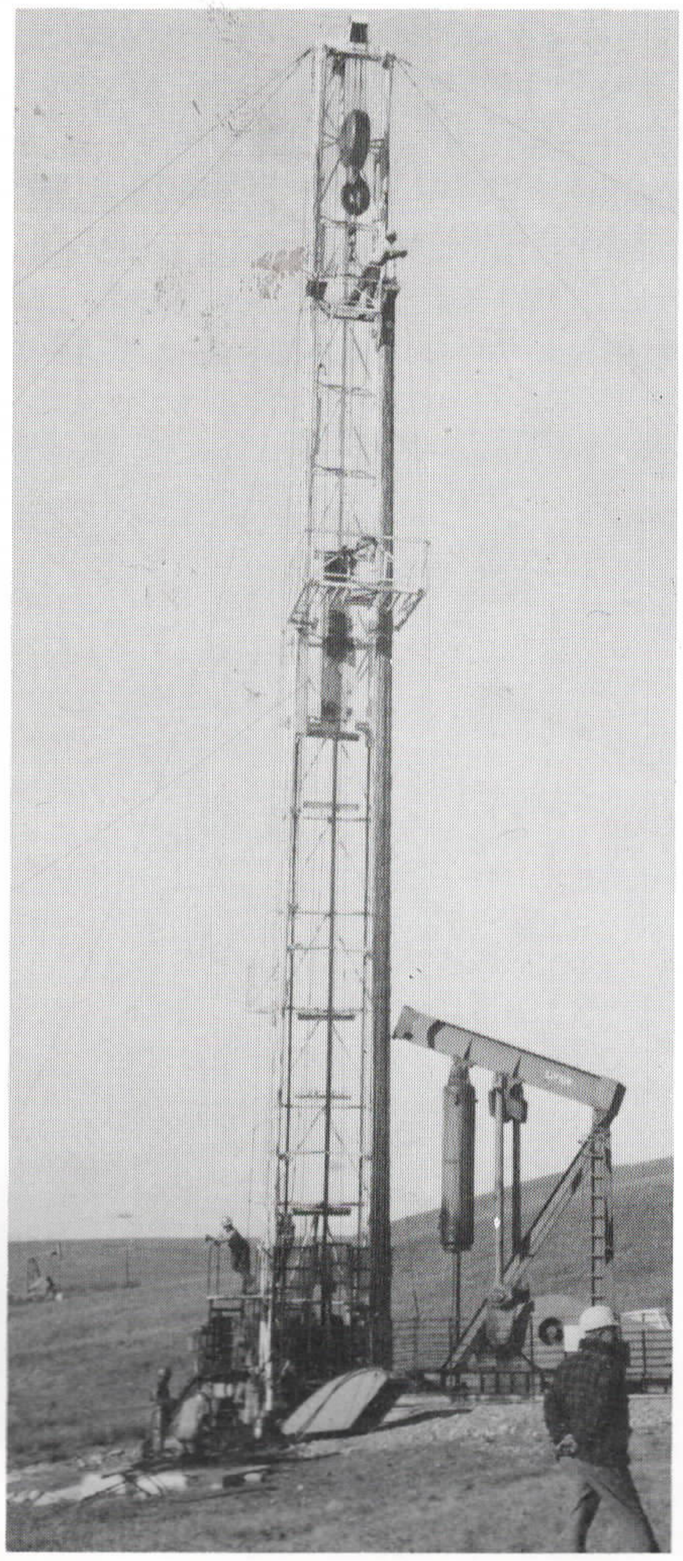
In an exploration program such aids or techniques as detailed geological mapping or seismic studies encourage the seekers to proceed with the final, and most expensive step: drilling.

Should the drilled hole reach a potentially productive zone, electrical measuring devices called "logging tools" are inserted in the drill hole to record on paper the extent and characteristics of the formation. If these "logs" are encouraging hollow steel pipe called "casing" is inserted in the drill hole, and a cement slurry is forced down to create a seal between the casing and the drill hole.



Below, a glimpse of complexity inside the butane section of the Turner Valley plant. Left, pump jacks are serviced regularly. Below left, pulling drill stem with conventional rig.





Even when a commercial well has been cased, further work is necessary to extract the petroleum.

Many wells, for example, do not have enough formation pressure to lift the petroleum to the surface of the ground, so other methods must be used. One of the more common would be a motor driving a "walking beam", like a see-saw, which operates a pump in the well. Old wells generally require pumping. Gas wells that produce little or no liquid have sufficient pressure to raise the gas to the surface and need no artificial lift devices.

When the petroleum is raised, equipment visible at numerous Alberta locations, separates water and gas from the oil.

The pressure in gas wells generally forces almost all the gas to the surface, but in most crude oil fields, less than one-third of the oil originally present can be produced using only the natural reservoir pressure.

The remaining oil requires "secondary" recovery methods for full exploitation. A number of wells in a field may be flooded with water which pushes the oil, which is lighter than water, towards the producing wells and in this way greater recovery is achieved.

Even water flooding still leaves one-half to one-fourth of the oil in the ground, so further methods must be employed to enhance additional recovery. These might include introducing other fluids such as alcohol or liquefied carbon dioxide. A jellying agent may be added, or a small amount of liquid hydrocarbon. Heat, as in steam, may be introduced into the well to make the oil flow more readily.

Most of these exploration and production techniques are common to the Western Decalta properties, and several of them are illustrated in the accompanying photographs from Turner Valley, probably the Company's best-known oil patch.

PEOPLE
at Decalta

Ethel Mackay

To Ethel Mackay, Western Decalta is family.

"I don't know what else you could call it," she says. "It's certainly much more than just a company. People here care about each other. I've been here over 20 years, and I still look forward to coming to work every day."

Ethel began coming to work every day for Western Decalta — then it was Canadian Decalta Gas & Oils Limited — in November, 1953. Having taken courses in comptometry and accounting she moved easily into the Accounting Department where her responsibilities now include payroll, insurance and employee health, savings and pension plans.

Ethel was born in Perth, Ontario, near Ottawa, but her family moved to Calgary when she was an infant. Many years later she made one further foray into the East, accepting a transfer to Toronto with Christie Biscuits, a company she had been working for in Calgary.

"I spent a year in Toronto," Ethel recalls, "and I liked it well enough. I was particularly fond of the maple trees in autumn, but the summer months there are so terribly hot and humid."

One year was enough, though, and family considerations and the tug of the West brought her back to Calgary to stay.

"Coming to work is a pleasure."

It was shortly after her return that she accepted what she thought might be just a temporary job with Canadian Decalta, filling in for a friend who was in a precariously advanced stage of pregnancy.

Although Ethel is well aware of the solid growth that has characterized Western Decalta, she says the large number of long-term employees may be a better barometer of achievement.

When she joined the company, its offices were in the Hail Insurance Building on 5th Street. Later they moved to a new building on 6th Avenue, and now, having become the latest member of the Loram Group of companies, are planning to move to the Group building on 7th Avenue.

Ethel insists that her recreational activities are much too commonplace to be of interest, yet she has travelled widely in Canada, is an avid bridge player, and has a streak of the gambler.

Because she has lived in both West and East, and because she has visited most of the provinces beyond and between, she does not equivocate about national unity.

"Canada should stay together," she says firmly. "It is far too good and too important to let fall apart."

As a well-travelled lady she has, of course, visited Las Vegas — several times.

"I like Las Vegas," she admits, "but I should really stick to the slot machines. When I hit the tables I have been known to stay just a dollar or two too long."

Sports don't enthral her and neither, she says in a conspiratorial whisper, does gardening interest her.

"We hire a gardener," she says. "Now isn't that terrible? But maybe you had better not say it; I wouldn't want people to think I'm lazy."

Not to worry. There's not much chance that people will think that Ethel Mackay is lazy.

Bert Niccoll

If you're looking for Bert Niccoll, you had better start with a full tank of gas and a map of Turner Valley.

Bert is Western Decalta's field superintendent at Turner Valley, which means that at a given time he might be at any one of 275 operating gas or oil wells in a 20-square-mile oil patch.

"Now don't say I'm hard to find," Bert admonishes. "The

"Responsibility — part of the job."

office always knows exactly where I am, and where my men are. That's part of the secret of this job: with only 15 of us in a large field we all have to be, well, responsible."

If "responsibility" is part of the secret, then "experience" and "capability" are the other important parts.

To the possible surprise of those who thought that Bert entered this world as a fixture on a drill rig, he was born in Highland Grove, north of Peterborough, Ontario. The family moved to Alberta, and Bert was raised on their farm near Athabasca.

It was only about a quarter century ago that he turned his hand from soil to oil. He worked for a year with Taylor Petroleum, then switched to Renfrew Producers as a battery operator — the person who actually operates a well.

Three years later, in 1955, Canadian Decalta, as Western Decalta then was known, bought Renfrew Producers, claiming Bert as one of its assets. For two more years he worked as a battery operator in the Malmo field.

Then Decalta bought 40 wells in Turner Valley from White Rose, and asked Bert to transfer there as chief operator. Bert and Western Decalta and Turner Valley have been together ever since.

Bert and his wife, Louise, live just south of the community of Turner Valley. A daughter works and lives in Calgary, and a son in Turner Valley.

His responsibilities cover the operation, maintenance and, if necessary, repair of Western Decalta's Turner Valley wells which include oil, gas and water injection.

Much of the maintenance work is contracted out, and Bert and the 14 men who work with him often are spread wide and thin. This is where the "responsibility" to work effectively and independently is so important.

"Turner Valley is an old field as gas and oil wells count their age," Bert says. "The first gas wells were brought in in the 1920's, the first oil wells in the 1930's.

Conforming with demands of the Turner Valley plant, not all wells operate at all times, and not all operating wells produce unattended around the clock.

Some wells are deep — 8,000 feet is not unusual — and the field generally requires careful nursing to maintain programmed production.

"What we need here," Bert says, "and what we have, is good men. Men who know their job, and who can work without tight supervision. With crews like that there's no trick to keeping the field producing."

Bert and his wife have a cottage in the Kootenay lakes district of British Columbia, so if you can't find him at Turner Valley you might see him stalking down the fairway at a Kootenay golf course, looking for an errant drive.

More probably, though, he will be on the water, trying to land another trophy-sized rainbow trout or landlocked salmon.

Safety Message

"Eye Alert"

Some years ago contact lenses were considered a "fad", principally due to cosmetic effects. Today they are a normal part of life.

Are you aware that contact lenses can become a hazard to the user, to the extent of possible loss of vision — in part or in total?

Every person who wears them (even in office or off the job locations) should wear a "medic-alert" bracelet or similar identification. For people becoming unconscious from medical problems or accidents, a routine examination by first-aiders or doctors unaware of the presence of contact lenses, could result in serious eye damage.

Cases are fully documented where eyes were damaged by:

- Contact lens adhered to the cornea from an electric shock.
- Dust trapped behind lens — imbedded — required surgery.
- Printing ink splashed into the eye. Nurse attempted to wash out with mild soap and unaware of contact lens, caused chemical burn.
- Foreign particles are normally washed away by tears, which cannot serve this function behind contact lenses.
- Chemical fumes, gases and smoke may damage the lens and impair vision until replaced.

In some industrial operations, the employer forbids the use of contact lenses while at work. In some legislative circles it is even proposed that they be banned.

We feel that these are drastic measures and may or may not be warranted, depending upon the location, hazard and nature of the work. While there are many arguments both pro and con, we do not advocate one or the other.

What we do ask is that you be aware of the potential problems that can arise. Exercise care and discretion in the interest of your personal protection.

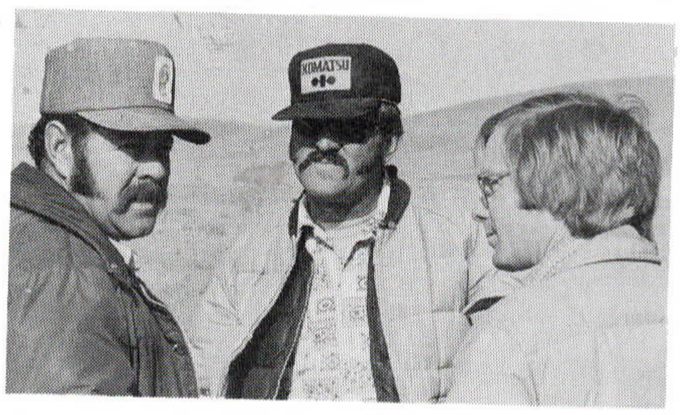
PROTECT YOUR EYES, THEY CANNOT BE REPLACED.

T. R. Anderson
Director, Industrial Safety

Pipeline Crossing

On March 27, 1977 the Pipeline Division of Loram International Ltd. successfully completed the placing of approximately 1,000 feet of pipe across the South Saskatchewan River for Pembina Pipe Line Ltd. The design, under Techman's supervision, was unique as it called for three 10 inch concrete coated lines, banded together and placed in a common ditch.

The crossing site was located just upstream of the Trans Canada Highway Bridge at Medicine Hat. Layout and assembly took place on the west side, with the land



Above, Cueball Morrison of Loram International discusses progress with Pembina's Dan Greger and Jim Russell. Below, pipelayers position pipe for crossing operation.

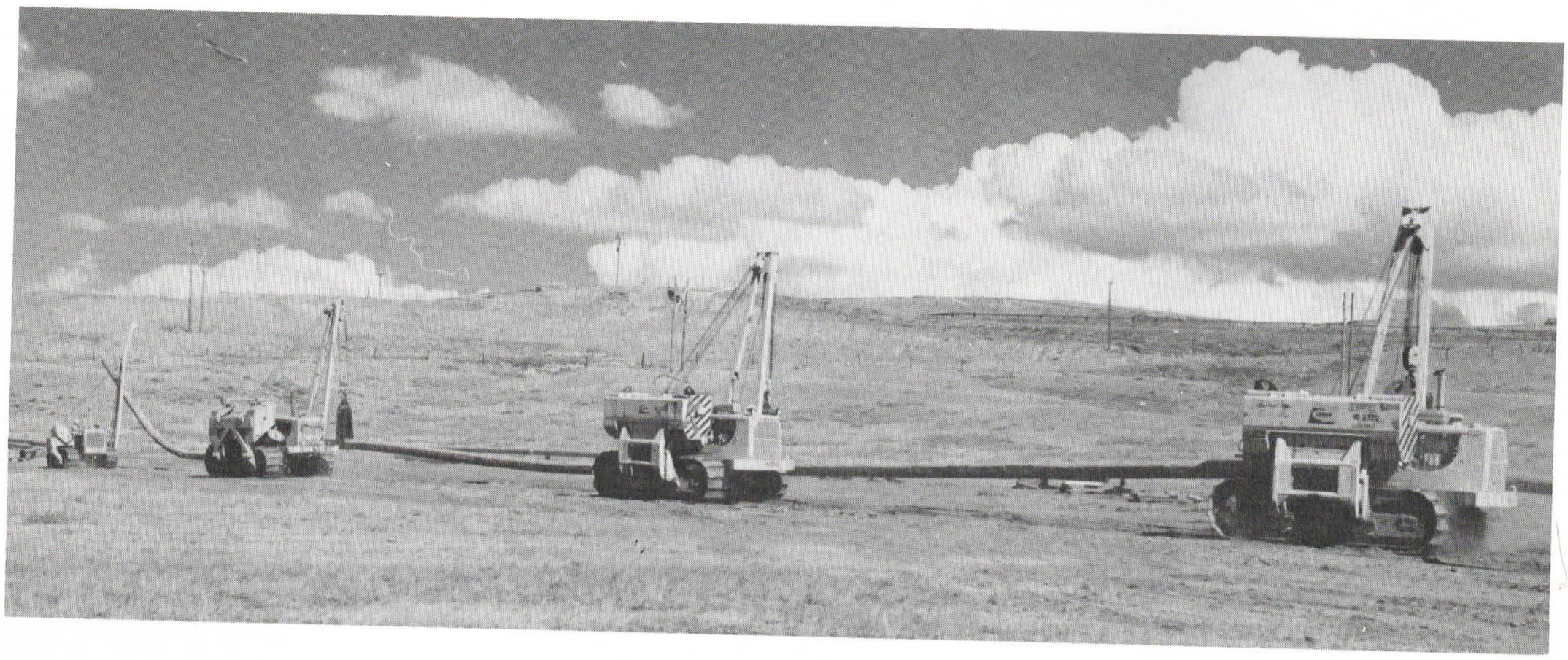
Sled-mounted dragline ditches river bottom at Medicine Hat.

crew bending the pipe and welding it into six sections. Each section was then coated with two inches of concrete which required a curing time of four days. After curing was complete, three of the sections were nested together into a pyramid shape using one inch steel banding at 10-foot intervals. This in effect, created two longer strings of nested pipe ready for the pull across the river, with one centre weld to be made during the pull.

While the land crew was preparing the pipe, a separate crew was employed on the marine trench. Water depth and specifications calling for nine feet of cover necessitated mounting an LS98 Dragline on a Sled. The Sled, previously built by the Ogden Shop, raised the machine approximately five feet and was pulled across the river by a winch line from a D8. One section of pea gravel was encountered west of the main channel and although progress was slowed until better bottom conditions were found, the overall marine trench was completed in good time. Both banks were excavated with a Cat 235 Backhoe.

As soon as the ditch was ready, the first half of the pipe bundle was carried to the start of the deep water using 3 - 583 and 1 - D7 Sidebooms. A cable sling, pulley, and three large floats were attached to the lead end of the bundle along with the pull cable which stretched across the river to the D8 winch tractor. The second half of the pipe bundle was then welded on. Finally, the main channel was installed with the D8 winching from the east side and the Sidebooms carrying the tail section on the west side. The entire pull was completed in less than one day.

After the final in place inspection by a scuba diver, the trench was backfilled and the lines were tested.



General Manager G. Thompson (second from left) congratulates (left to right): Al Hicks, Wilf Sleno, Roy Cabel, Ken Hausherr and Joe Radowits for 20 consecutive safe driving years.

Pembina's Pipe Line Division Safety Program

Safety is an integral part of the operation of Pembina Pipe Line Ltd. The nature of the service provided by the Pipe Line Division requires that employees work outdoors in all extremes of weather, operate vehicles on all road conditions and be exposed daily to hazards related to the oil industry. Although these employees are frequently required to labour under conditions less than ideal and difficult to completely overcome, their record of safety speaks highly of them and an active safety program.

Under the guidance and direction of Mr. Don L'Hirondelle, Safety Co-ordinator for the Pipe Line Division of Pembina, the program consists of many facets including courses available to employees such as Defensive Driving, Saint John Ambulance First Aid as well as fire fighting training and exercises.

Pembina is one of twenty participants in the Alberta Gas and Oil Pipeline Operators Safety Council. Regular safety meetings are held and the company provides or subsidizes safety equipment including hard hats, safety glasses and safety shoes.

As of April 4, 1977, Pembina's Pipe Line Division had completed two full years without sustaining a lost time accident. The results of the Pipe Line Division's extensive safety program are evident by three awards presented to them for 1976. Awards received for no lost time accidents were the Occupational Health and Safety Award and the Alberta Gas and Oil Pipeline Operators Safety Council. In addition, of the twenty companies that participate in the Alberta Gas and Oil Operators Safety Council, Pembina achieved the award for lowest accident frequency rate.

At the February 18, 1977 meeting of the Joint Industrial Council held in Edmonton, Pembina honoured its employees who hold enviable driving records. Recognized for twenty years of consecutive accident free driving were Al Hicks, Wilf Sleno, Roy Cabel, Ken Hausherr and Joe Radowits. Also presented with awards were Cliff Erickson and Jack Ego for fifteen consecutive years of safe driving.

Pipeline Division Manager L. Gano presents 15 year awards to Cliff Erickson and Jack Ego.

Techman Expands Capabilities

To meet the rapidly increasing demands for its services, the Coal Group of Techman Ltd. has recently been increased by the appointment of senior personnel. With the naming of Boyd Payne, Senior Coal Preparation Specialist; John Hinds, Senior Coal Quality Specialist; and Dave E. Rose, Project Engineer; our Coal Group becomes one of the strongest in its field in Canada.

The group is under the direction of Brian W. Raymond, whose association with Techman Ltd. began in 1971, and who previously has been the coal preparation supervisor for Manalta Coal Ltd. While with Manalta Coal he was responsible for assessing coal quality of Manalta's extensive coal leases, the buying and selling of a 500 TPH coal preparation plant in Oklahoma, and the design of the Gregg River plant. Prior to that he was responsible for the feasibility study on a 14,000 TPH oil sands extraction plant for Shell Canada Ltd., and was plant superintendent at Cardinal River Coals Ltd.

Boyd Payne joins Techman after several years of supervising quality control operations at the mining and coal preparation facilities of McIntyre Mines Limited at Grande Cache, Alberta. In this role Mr. Payne was deeply involved in the processes of Coal preparation as well as in laboratory procedures and techniques. Previously, he was the quality control engineer for Coleman Collieries Limited.

Brian Raymond

John Hinds

Dave Rose

Boyd Payne

Before joining Techman, John Hinds was manager of the Calgary coal testing laboratory operated by Warnock Hersey Ltd. In this position he developed the laboratory into one of the best known facilites in Canada for the testing of both metallurigical and thermal coals. Mr. Hinds has had considerable experience with coals from all the producing areas as well as the potentially productive areas in both Western and Eastern Canada.

Dave Rose has a background of project engineering experience which, besides a short stint with the coal mine development program of Gregg River Resources, included eight years of oil sands and mining projects with Fluor Canada Ltd., and Great Canadian Oil Sands Ltd.

The immediate success of this group in Techman has been demonstrated by current major assignments from Elco Mining Limited, Gregg River Resources Ltd. and Union Oil Company of Canada Limited.

The Coal Group has been reinforced at a time when there is renewed interest throughout the Canadian coal industry in coal preparation facilities. This group will now provide a complete range of consulting and engineering services extending from management of exploration and bulk sampling programs, coal quality evaluations, complete feasibility studies, process flow sheet selection, equipment specifications, and design and layout of the facilities.

Manalta Holdings Ltd.

Building Maintenance and Security

Beyond the doors of the head office building of the Loram group of companies, at 320 - 7th Avenue S.W., is an attractive business community working in 172,485 square feet of office and retail business space.

Maintenance of the building is the overall responsibility of Manalta Holdings Ltd. and particularly of Building Superintendent Harold Hedstrom. Harold first joined the Company in 1936 and worked steadily on construction and equipment from 1941. Appointed Building Superintendent in January, 1976, he transferred his attention and experience in maintenance and security to our new premises in June, 1976. He and his staff are responsible for operation of the building and ensure that the needs of tenants are met.

Sounds relatively simple? Following are the main areas that Harold keeps track of every day of the year.

Harold Hedstrom — instrument panels pinpoint condition of office environment.

Hal Maitland cleans scale accumulations from cooling tower vanes, one of many "behind the scenes" tasks that maintain office comforts.

- Security — Four full time and two part time security staff are maintained on a 24 hours a day, seven days a week schedule.
- Cleaning of the building involves overall supervision of the cleaning contractor's staff.
- Operation and servicing of all mechanical equipment which includes heating, air conditioning, elevators, electrical facilities and lighting, and plumbing facilities.

Harold, and his assistant Hal Maitland, are on call round the clock. They are equipped and ready to provide immediate first aid for faults that occasionally develop in heating facilities, switchgear, plumbing, lighting, and sometimes to plan or assist with moves and renovations.

Anything from a sticky chair castor to a cold draft usually results in a prompt report to the Building Superintendent and is soon rectified. If there are major problems in heating, plumbing or electrical facilities that can't be handled internally, specialists are brought in as required and the job supervised to its satisfactory completion.

Heating and air conditioning, though only one aspect of the maintenance operation, is the one of which people are most aware, says Harold. Maintaining proper balance between warm, steam-heated air and the cool air supplied by the Centravac unit or a standby chiller, is a basic maintenance function.

Sensors located throughout the building quickly report the unpredicable effects of sun, wind and weather change. Meters and dials located in the Building Superintendent's office report performance of all components along with temperature conditions.

There's much more to providing a pleasant work environment than changing fluourescent tubes. Ask Harold Hedstrom.

KNOW Your Support Services

Madeleine Barry — sophisticated telephone system at her fingertips.

The support services provided for the group by Loram Co. Ltd. are vital to efficient day-to-day operation. Fast, efficient communication and the management of business records are two of the vehicles that carry the work of all of us toward well-organized conclusions.

Central Switchboard

One of a number of sophisticated communication facilities, the Central Switchboard is probably the main line of contact for virtually every member of the organization. With this in mind, a new communication system, the SL1 switchboard, has been installed at Loram's head office building in Calgary. Made by Northern Telecom. Loram was Alberta Government Telephones' first customer for the total system.

The system is customized to serve the diverse needs of our Group companies, whose activities include nearly every type of construction, coal production, engineering and environmental expertise, oil and gas, manufacture of railroad maintenance of way equipment, mineral exploration, industrial equipment sales and farm, ranch and real estate activities.

NERVE CENTRE

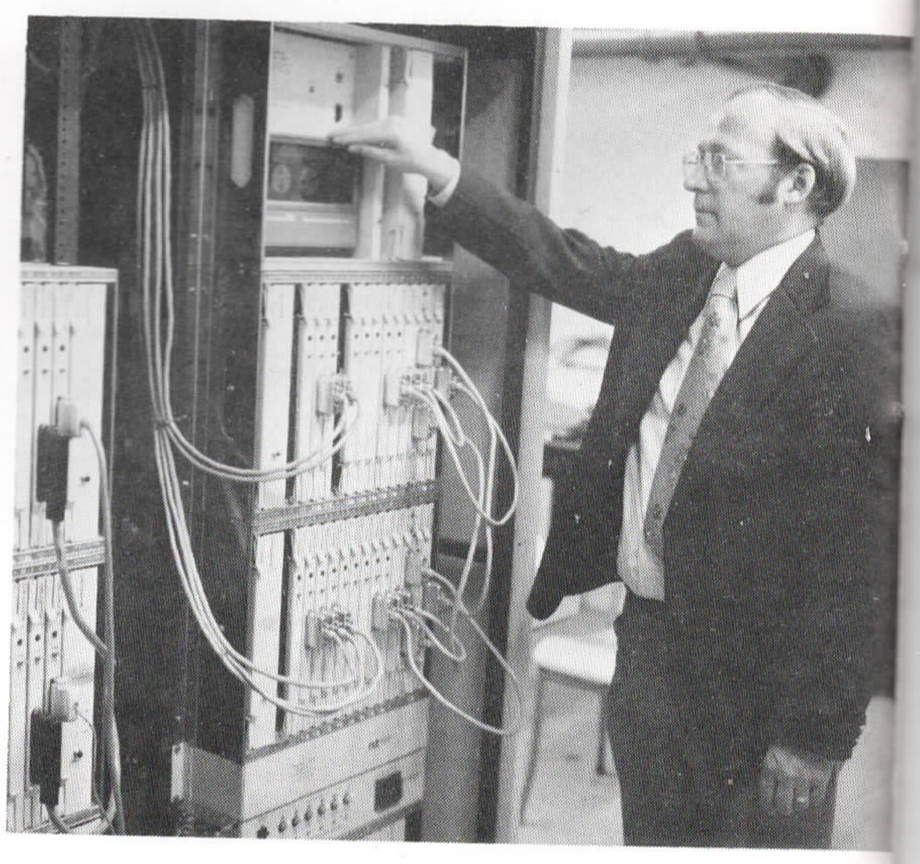
Our SL1 installation, locked out of sight in a basement room, is the nerve centre for the system. Here a computer, housed in cabinets, allows utilization programming for each telephone set. More than 350 of these sets throughout the building are almost evenly split between the conventional black "500" sets (with special SL1 features hidden inside) and the 25 button SL1 desk set.

All SL1 sets are equipped with the "ring again" feature. When a call is made to another extension from within the building, and that number is busy, the caller presses a button and hangs up. When the line is free, his desk set buzzes, a light flashes, and the system calls back automatically.

Other features include call forwarding, voice calling (which lets you call a pre-designed SL1 extension over a built-in loudspeaker), multiple call arrangements, and conference calls for up to six different people. Speed calling permits dialing either up to 10 or up to 50 preselected numbers, including long distance. People using an SL1 set received instructions from A.G.T. on features available and their use.

SL1 DISTRIBUTION

Neville Crane, Manager of Administration Services, was responsible for co-ordinating the best distribution of SL1 and conventional sets. The decision was based on job function and need. Subsequent to installation,



Neville Crane points out the program for the entire telephone system.

some individuals elected to drop features that were not used, replacing them with others that better served specific needs. Currently, with a pending move of Western Decalta Petroleum into the building, along with internal changes of personnel locations, Neville is busy with further telephone facility changes.

According to Switchboard Operator Madeleine Barry, the system mainly handles Loram International's long distance calls at present. These average some 80 calls daily. In the near future the WATS (Wide Area Telephone System) will be installed and will eventually provide a central service for all companies in the group.

The FX Line (direct line to Edmonton) is used by all companies. These calls, placed through the switchboard, average about 70 calls a day. Records are kept of all the calls on this line, whether incoming or outgoing.

Another service provided by the Central Switchboard is obtaining telephone numbers and addresses either for the placing of calls or to provide numbers to individuals for independent use. The switchboard has a large selection of telephone books covering major Canadian and American cities.

George Alderson, Central Registry Supervisor, classifying correspondence.

Central Registry

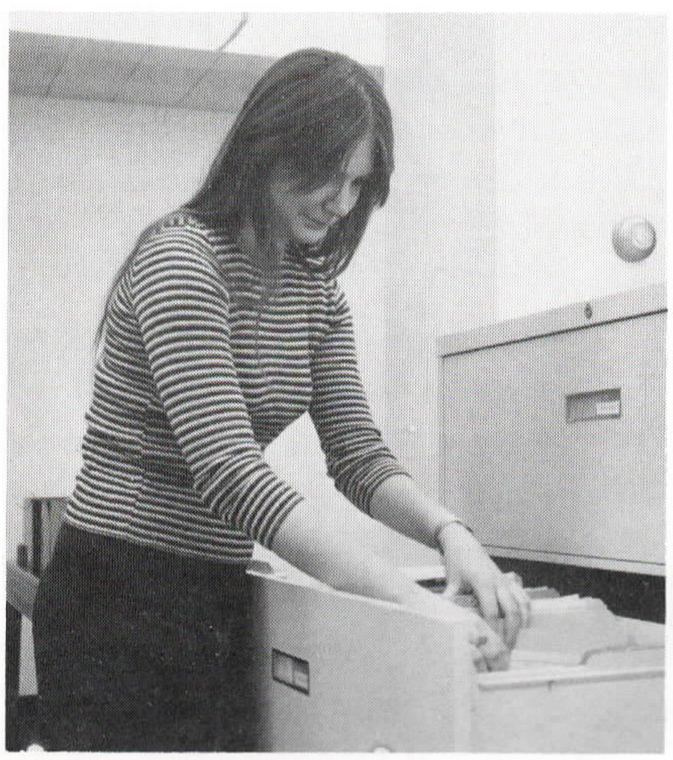
To answer the filing problems of the Loram group of companies, a competent staff under Administrative Services has implemented an effective plan of files and correspondence management under a strict and confidential central system.

The records management concept consists of classification of papers by means of a planned system, the care and custody of files, the controlled circulation of these files, ready retrieval of correspondence and its eventual disposal on behalf of Management.

The administrative staff in the records office is responsible for the effective control, custody and preservation of the various documents retained in the Central Registry. Supervisor George Alderson classifies and indexes the incoming correspondence, then passes it to Central Registry Clerks Danielle Reichheld and Susan Hicks. They in turn record it, place it on the appropriate subject file and deliver it to the appropriate company. When the file is returned to the Central Registry, the correspondence is placed chronologically on the file, and returned to the proper file drawer.

To date the Central Registry serves Loram Co. Ltd., Lorinco and Manalta Holdings Ltd.

Future duties will also include the microfilming of redundant files, the consequent disposal of dead files and the computerization of the Daily Purport which is kept in Central Registry.



At left, Susan Hicks demonstrates ready storage and retrieval of records files. Above, Danielle Reichheld delivers input for file index to the computer.

Carl Kamm, left, discusses exploration potential of samples taken during a field trip.

The Odds for Success

This is the second in a series of exploration articles by Carl Kamm, President of Exploram Minerals Ltd. Vancouver, B.C.

In the previous issue of the Loram Story, we touched briefly on the odds against successful prospecting and exploration. To calculate these odds, consider how much of the earth's crust is accessible by present day technology, what is known of the abundance of elements in that crust, and the cost of making a worthwhile or viable discovery.

The crust is the only accessible part of the earth. It is considered to range in thickness from six miles in the ocean depths to 37 miles in the continental mass, and to average 10 miles in thickness. The deepest borings into the crust by man are about 4½ miles; the deepest mine workings are much less.

One of the deepest mine workings in Canada is in the Kirkland Lake gold camp where the lowest workings are 9,924 feet beneath the surface and more than a mile below sea level. One of the deepest mines in the world is a gold mine in South Africa, with a depth of 11,838 feet or 2¼ miles below the surface.

Eight common elements make up about 99 per cent of the earth's crust. These, in order of abundance, are oxygen, silicon, aluminum, iron, calcium, sodium, potassium, and magnesium. These are the usual rock-forming elements. Average rock is almost half oxygen and one-quarter silicon. These two elements alone represent about 75 per cent of the weight of the earth's crust.

Aluminum, iron and magnesium, though abundant, seldom occur in concentrations sufficient to represent an ore — material that may be mined at a profit. For example, although Canada is plentifully endowed with aluminum, no aluminum ore is as yet mined in Canada. All other elements, and there are more than 90 of them, are everywhere in the earth's crust. They represent the remaining one per cent of the total weight of the crust, three-quarters of which is covered by oceans. Much of the land mass also has cover in the form of ice fields, forests, lakes and overburden.

The base and precious metals that we search for, such as nickel, zinc, copper, lead, tin, uranium, molybdenum, silver and gold, are well hidden and the chance of stumbling over a mineral deposit today is very small indeed.

For the elements in the earth's crust to become ores, requires one or more of several natural concentration processes in nature. The ratio of concentration required to make an ore, varies with the elements concerned. For example, to have an ore of aluminum from average rock requires a concentration of four times, but to produce an ore of silver from average rock requires a concentration of 2700 times. Ore bodies are unique.

The cost of making a worthwhile or viable mineral discovery has increased in the past thirty years from an average of $2 million to an average of $30 million. However, since some of "average" expenditures is wasted through misdirection, proper direction should reduce the average cost indicated.

The odds for success are not to be taken lightly. To do better than average and to improve the odds, takes experience, knowledge, proper use and choice of the detection methods available, plus financial support to cover the costs of exploration.

The reason for accepting these odds lies in the rewards that accompany or should accompany, the satisfying of vital needs for ourselves and world civilization. In less realistic but possibly more understandable language, the reason is in the pot of gold at the end of the rainbow.

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